Tobacco Use Multimedia System for Children

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Abbreviated Abstract

Cancer is the second leading killer in the United States. To achieve the National Cancer Institute (NCI) goal of 50 percent reduction in cancer mortality by the year 2000, prevention education will need to be more accessible, to elicit behavior change from more people. Considering that smoking is the single most important preventable cause of illness and premature death in the United States, it is more than appropriate to pursue innovative techniques for tobacco use prevention. Children and youth are the population groups that are at the greatest risk for adopting a tobacco use habit. Since age at tobacco initiation continues to drop while the percentage of smokers in their teens continues to rise, it is clear that children need information and behavioral guidance to help prevent the onset of tobacco use. Furthermore, they need a way to get this information that they find exciting, engaging, and challenging.

We propose electronic lessons and activities on tobacco use prevention on a cross platform CD-ROM and on a World Wide Web site. Targeted to 10- to 12-year-old children, the program will be distributed throughout schools nationwide, with additional opportunities for distribution in hospital-based community education programs, public health agencies, community-based outreach programs, museums, and private homes.

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Research Team & Affiliations

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Total Budget

$842,228

Research Objectives

AIMS

1. Establish the framework for effective product development.
2. Develop the tobacco prevention CD-ROM.
3. Evaluate the interactive multimedia product.

Theory/Hypothesis

The evaluation was designed to test the following hypotheses:

- Students who use the CD-ROM will have greater knowledge of the negative effects of smoking and be less likely to agree that smoking has any positive physical effects, compared to students who are exposed only to existing tobacco education programs.
- Students who use the CD-ROM will be less likely than those with only standard tobacco education to agree that smoking has positive social consequences.

- Compared to students exposed only to standard tobacco education, students who use the CD-ROM will be more effective at dealing with social situations involving others who smoke.
- Students who use the *DigDeeper* program will have more certainty regarding their behavioral intention not to smoke than do students who receive only standard tobacco education.
- Students who use the CD-ROM will have less susceptibility to smoking than do students who receive only standard tobacco education.
- Compared to students who receive standard tobacco education, students who use the InfoUse CD-ROM will have greater awareness of tobacco company influence tactics. The majority of children with cancer, parents, siblings, and classmates who participate in the *Crusaders Against Cancer* intervention will report a high level of acceptability.

Experimental Design

ETR Associates obtained a list of fifth- and sixth-grade classrooms able to participate in the study at each participating site. Of those classrooms, we randomly assigned (using a table of random numbers) half of the available classrooms to the treatment group and the other half to the control group. For schools with only one classroom available at each grade level (fifth/sixth), we randomly selected one grade level for the treatment group and the other grade level as the control group at that site.

The study design was a pretest-posttest comparison group design in which the classroom was used as the unit of randomization and assignment, and the individual was used as the unit of analysis (due to concerns regarding statistical power). Classrooms of fifth- or sixth-grade students were randomly assigned to participate in either the control or treatment condition of the study. The HIV/AIDS CD-ROM was dropped as part of the control condition due to district rules about HIV/AIDS instruction for the age group of the sample. Further, the *DigDeeper* CD-ROM replaced 3 hours of the standard instruction for the intervention group rather than supplementing the full 6 hours that the district normally teaches. A stratified sampling procedure was used to assign classrooms by grade and school to either the treatment (CD-ROM and tobacco-use prevention education [TUPE]) or control (TUPE only) condition. During the study, some classes received no TUPE instruction and others received only the CD-ROM.

All students completed a pretest survey, administered by trained data collectors who read the survey aloud to participants. The survey was designed to obtain basic demographic information and to measure tobacco-related knowledge, attitudes, susceptibility, and behavioral intentions (see below for more details on the survey). Demographic information was used to match pretests and posttests. All students completed a posttest survey, which was identical to the pretest survey but with process-related questions added for the students who used the CD-ROM. Trained data collectors also administered the posttest.

Posttests for students receiving the CD-ROM were conducted within the week after the intervention at each school. For control groups, posttests were conducted either on the same day as the corresponding treatment groups' posttests or after the TUPE coordinator conducted her education hours in that classroom. Control groups received their posttests between 1 and 6 weeks after the pretest, depending on the schedule of the TUPE coordinator at that school.

Final Sample Size & Study Demographics

The six participating schools included 3,855 students, ranging from 244 to 1,039 students per school site (M = 642.5). The racial/ethnic composition of the study schools closely matched the district demographics. Specifically, 37 percent of the students from the sampled schools were African American/Black, 31 percent were Asian, 22 percent were Hispanic/Latino, 9 percent were White, and the remaining 3 percent were Filipino, Native American, Pacific Islander, or "other." Across the six participating schools, 55 percent of the students qualified for free or reduced-price lunches.

Twenty classrooms with a total enrollment of 595 students at six schools participated in the InfoUse project. Of these, 61 percent returned consent forms, either positive or negative. Of the 363 students who returned consent forms, 334 (92%) returned consent forms with permission to participate in the survey. Of the 334 students with their parents' permission, 97 percent took the pretest and 86 percent completed the posttest.

Data Collection Methods

Surveys

Outcome Measures

- Knowledge of negative health effects;
- Knowledge of tobacco company influence;
- Social attitudes toward smoking;
- Attitudes toward physical effects of smoking;
- Attitudes toward harmfulness of smoking;
- Refusal skills;
- Decisionmaking skills;
- Availability of tobacco;
- Friends' tobacco use;
- Prior tobacco use;
- Confidence;
- Intention to smoke; and
- Overall impression of the InfoUse CD-ROM.

Evaluation Methods

The primary goal of the analysis was to compare intervention and comparison groups at posttest on all key impact variables assessed on the survey (e.g., knowledge, attitudes, and intentions). Change scores over time (from pretest to posttest) were calculated and compared to the change scores of the intervention and comparison groups, using independent *t* tests (or Pearson chi-square for the dichotomous decisionmaking variable) to determine the extent to which the magnitude of change differed *between* groups.

Research Results

- A total of 278 participants took both the pretests and posttests.
- At pretest, knowledge of negative health effects mean scores were 1.62 for each group, indicating an already high level of knowledge about the physical effects of smoking. At posttest, the TUPE-only group showed a greater change in knowledge, but this difference was not statistically significant.
- The mean scores for each group at pretest ranged from 1.56 to 1.62, suggesting that students in each group already had nonsmoking attitudes about the social effects of cigarette use. Mean scores in both groups changed in an undesired direction from pretest to posttest. The difference between groups was not statistically significant.
- Students in the TUPE-only group were more likely to indicate that occasional use was "extremely harmful" at posttest as compared to the CD-ROM plus TUPE group, although the change in scores was not significant between groups. Both group means decreased at posttest on the variable measuring the harmfulness of frequent use, suggesting that participants in each group were more aware of the risks of frequent smoking. Again, the changes in scores were not significant between groups.

- The data suggest that the intervention group had a greater increase in refusal skills at posttest, and this change was nearly significant ($p = 0.07$).
- Mean scores at pretest were 1.29 and 1.47 for the intervention and comparison groups, respectively, suggesting that the susceptibility of the participants was relatively low to start. Still, very small changes in the positive direction from pretest to posttest were found for both groups; however, the magnitude of change between groups was not statistically significant.
- The mean scores on the confidence measure at pretest were 1.47 and 1.61 for the intervention and comparison groups, respectively. Both groups showed improvement in the level of confidence they have that they would not smoke when given the opportunity; however, the magnitude of change between groups was not statistically significant.

Barriers & Solutions

Product(s) Developed from This Research

DigDeeper: CD-ROM and Web site